



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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May 2, 2001

CERTIFIED RETURN RECEIPT
7000 0520 0021 7582 9132

Lee Jenkins
Environmental Coordinator
American Gilsonite Company
Bonanza Operations
HC 73 Box 28
Vernal, Utah 84078-9284

Re: Proposed Changes in Reclamation of H-2 and H-10 Sites; American Gilsonite Company (AGC), Bonanza Operations, M/047/010 (ML-851), Uintah County, Utah

Dear Mr. Jenkins:

The Division has reviewed your submission received April 27, 2001, describing the proposed changes in reclamation at the H-2 and H-10 sites on patented lands along the Harrison Vein. We understand you wish to begin work on these projects on May 7, 2001, or within 13 days of first discussing this project over the phone on April 24, 2001.

While we appreciate American Gilsonite's interest in completing the reclamation of these sites, it is difficult for the Division to review modifications to a large mine operation reclamation plan within the time frame you have allowed. We realize that unfamiliarity with our permitting process and recent changes in work responsibilities may have been factors in the timing of this submission. **Based on the general information provided thus far, the Division cannot accept these proposed changes to the reclamation plan. Therefore, the proposals are not approved at this time.** In order to pursue these proposed reclamation changes further, American Gilsonite will need to provide more specific information to address the comments outlined below.

For future reference, according to the Minerals Rules, a minor modification ("Amendment") to an approved large mine notice is to be considered for approval in the same manner as an original notice of intention, i.e., a minimum of 30-days from the date of submission. A significant modification ("Revision") to an approved large mine notice can require a longer review period. A Revision requires Division review followed by a 30-day public comment period before Division approval.

H-2 and H-10 Escapeway Shafts – Proposal Summary

American Gilsonite proposes to use foam sealant as the main closure for the escapeways. The surface around the shaft will be cleaned of loose rock and dirt. The depth (thickness) of the foam plug is proposed to be four feet. Shaft supports and 2" x 6" planks will be placed at the depth of four feet as a form to support the foam. Chain link fencing will be placed within the middle of the four-foot foam plug and also near the surface. The foam plug will be allowed to extend over the shaft edges on the surface for extra support. The approved typical reclamation plan for these escapeways called for installation of a secured concrete cap.

Division Comments on Escapeway Closure Proposal

Describe the reason for lack of road access to the escapeway sites. A topographic map showing the escapeway locations should also be included.

Describe how the form supplies and foam would be transported to the site.

How many foam escapeway closures are being proposed at these sites?

Describe the respective dimensions of each escapeway opening and its depth.

Describe the shaft supports that the wooden planks will rest on, and how they will be tied into the shaft wall or lining.

Provide justification for this escapeway closure method as a safe and vandal resistant design.

The "mushroom effect" of allowing the foam to extend over the edges of the shaft opening would not seem to significantly increase the strength of the foam plug since the foundation form will be fortified. The foam is not UV resistant and leaving the top surface exposed to the sunlight would decrease the longevity of this type of closure. Our Abandoned Mine Reclamation (AMR) Program's contract specifications for a foam shaft closure require covering the foam plug with a layer of concrete and placing earthen fill over the concrete. Please provide justification for your proposed design or modify the design to be resistant to UV degradation and erosion. A soil cover with vegetation as the top layer is generally preferred.

Our AMR Program's contract specifications for a foam shaft closure require a minimum depth of foam based on ratios of the opening dimensions (excerpt from typical contract specification enclosed). We cannot confirm the currently proposed design will meet those guidelines without more specific descriptions of the escapeway openings.

H-2 and H-10 Main Shafts – Proposal Summary

American Gilsonite proposes to move concrete footers used to support surface structures over the shafts and then covered with soils for final closure. The approved typical reclamation plan for the main shafts called for installation of a secured concrete cap.

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M/047/010
May 2, 2001

Division Comments on the Main Shaft Closure Proposal

Confirm that this closure method is being proposed for one shaft at each of the two sites.

The Division's summary listing of American Gilsonite sites incorrectly listed the H-10 site as being located in the SW ¼ Section 1, T11S, R24E. Please confirm that the correct range for this site is R23E.

Describe the dimensions of the shaft openings and their respective depths.

Describe how the concrete footers will be secured over the openings or tied in to the shaft collar/lining, and describe the number of footers to be used at each site.

Describe the minimum depth of soil being proposed to cover the concrete.

Provide justification for this main shaft closure method as being safe and vandal resistant.

We appreciate American Gilsonite's interest in reclaiming these sites as soon as possible, and we will attempt to review any reclamation proposals as expeditiously as possible. If you have any questions in regard to this letter please contact me at (801) 538-5286, or Tony Gallegos at (801) 538-5267.

Sincerely,



D. Wayne Hedberg
Permit Supervisor
Minerals Regulatory Program

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Enclosure: AMR Contract Specifications – excerpt Polyurethane Foam Shaft Closures
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AMR
CONTRACT SPECS

SECTION 0254 POLYURETHANE FOAM SHAFT CLOSURES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The polyurethane foam (PUF) closure consists of installing a bottom form, installing PUF to specifications, installation of drainage material, topping the PUF with a layer of concrete, and backfilling over the PUF to the specified level with random fill. One ventilation/drainage pipe is required. Refer to the drawings for construction details.

1.02 SUBMITTALS

- A. CONTRACTOR shall submit *with the bid proposal* the proposed construction procedures, including a description of the form materials to be used and the foam application equipment or method.

1.03 RELATED WORK

- A. Section 0250: Mine Closures
- B. Section 0251: Cast-In-Place Concrete
- C. Section 0252: Concrete Reinforcement
- D. Section 0300: Specific Site Requirements

PART 2 - PRODUCTS

2.01 MATERIALS

A. Formwork

- 1. The bottom form and cross members may consist of any commonly available building materials capable of sustaining the initial lift of two to four feet of PUF. Examples of acceptable bottom forms and cross members include, but are not limited to, the following:

CROSS-MEMBER & BOTTOM FORM

Rebar & Plywood

2x4s & Cardboard or Chicken Wire

Dowels & Paneling

Cardboard Tubes & Carpeting

Blocks of PUF (generated onsite)

Waterbed Mattresses (inflated remotely in the shaft with a hose and air compressor)

- 2. Any combination of the above noted materials that achieves the required performance will be acceptable. Alternate bottom forms will be acceptable upon approval by the OWNER.
- 3. Any breach in the bottom form caused by vandals or rock fall is required to be repaired before the arrival of the PUF applicators to the site. The CONTRACTOR is responsible for

the integrity of the bottom form, and the loss of any polyurethane should it fail.

B. Polyurethane Foam (PUF)

1. PUF is required to have a minimum installed density of 1.85 pounds per cubic foot (pcf). PUF characteristics shall conform to the minimum following standards:

PUF CHARACTERISTIC	STANDARD	SPECIFIED IN
Density	1.85 pcf, nominal	
Closed cell content	90%	ASTM D-2856
Compressive strength	25 psi	ASTM D-1621
Water absorption	1% by volume	ASTM D-2127
Exothermic Reaction Rate	Low	
Fire Resistance	Low	ASTM D-1692

Polyurethane foam used may not contain any CFC's (chlorinated fluorocarbons).

C. Proportioning Unit

1. The proportioning unit shall be capable of attaining a minimum temperature of 125°F. The proportioning unit shall be Gusmer Model H-11 or equivalent. For remote sites, or with approval of the OWNER, smaller capacity proportioners will be acceptable. In this event, the proportioner shall be the Gusmer FF, or equivalent.
2. Minimum heated hose length from proportioner to gun shall be 80 feet. The hose shall maintain or increase component temperature from the proportioner. Longer heated hose lengths may be required depending upon distance from the proportioning unit to the reclamation site.

D. Application Gun

1. The application gun shall be capable of mixing plural components in the proper ration at the minimum acceptable output of four pounds per minute. The gun shall be a Gusmer AR mechanically self-cleaning design, or equivalent.

E. Prepackaged, Preproportioned PUF Kits

1. PUF products consisting of factory prepared kits that are designed to combine and dispense premeasured quantities of components in the proper ratios may be used in place of an onsite proportioning unit and application gun, with the approval of OWNER. One such product is the foam closure bag manufactured by Foam Concepts Inc. (see Part 2.01.J below). PUF kits shall be used according to the manufacturer's specifications.

F. Cement Plug

1. Concrete for the cement plug shall have a minimum compressive strength of 3,000 psi in 28 days. The concrete shall be proportioned in accordance with ACI 211. The type of cement used shall be Portland, Type II (ASTM C150). Air entrainment shall be furnished in all concrete. Air content shall be 5%± 1%. Water/cement (W/C) ratio is approximately 0.49 w/min. cement content of 564 lbs/CY. Concrete mixed at the jobsite shall be in accordance with ACI 301, chapter 7. Ready mix concrete shall be in accordance with ASTM C94.

G. Filter Cloth

1. The filter cloth, either woven or non-woven at the CONTRACTOR's option, shall have a minimum thickness of 15 mil in accordance with ASTM D-1777 and a minimum permeability of 10^{-2} cm/sec, such as Fibertex 150® manufactured by Crown Zellerbach or equivalent approved by OWNER. Prior to installation, the CONTRACTOR shall provide the OWNER with documentation that the filter cloth furnished meets the chemical, physical and manufacturing requirements of this Section.

H. Ventilation/Drain Pipe

1. The ventilation/drain pipe shall consist of 2-inch diameter SDR 35 PVC or similar gauge HDPE pipe.

I. Random Fill Material

1. Random fill material shall consist of native, on-site soils and sandstone rock. The types of miscellaneous fill material to be used shall be approved by the OWNER prior to initiating the work.

J. Suppliers of PUF

1. Potential suppliers of polyurethane foam (PUF) are:
 - a. CPS (Phil McClain, Gary Shepherd)
3407 N. El Paso
Colorado Springs, CO 80907
(719) 475-9443 (800) 475-9443
 - b. Foam Concepts, Inc.
130 West Superior Street, Suite 420
Duluth, MN 55802
(218) 720-2992
 - c. Flame Safety Supply
2478 South 900 East, Suite 5
Salt Lake City, UT 84106
(801) 486-9404 (800) 767-2409

- d. Mills Services Inc. (Marshall Mills)
328 Glenmawr Drive
Rawlinsville, CO 80474
(303) 443-6470

PART 3 - SAFETY

3.01 MATERIALS

- A. Materials shall be stored per the manufacturer's specifications. All safety precautions outlined by the Polyurethane Division of the Society of Plastics Industries, NFPA, OSHA, EPA and the manufacturer's Material Safety Data Sheets (MSDS) shall be observed. MSDS and technical data sheets shall be on-site and available at all times.
- B. There shall be no welding, smoking or open flames within 100 feet of PUF application. A minimum 15 pound, class ABC, fire extinguisher must be on site at the mine opening where the PUF is being applied during foam application.
- C. Oxygen Content of Working Area
 - 1. A flame safety lamp or oxygen meter must be used to test air before and during installation of the bottom forms. The flame safety lamp or oxygen meter will be supplied by the CONTRACTOR and operated only by the Certified Person. Refer to Section 0250, Part 1.04.
 - 2. Oxygen Meter. The oxygen meter shall be a National Mine Service (NMS) OX231 oxygen meter or equivalent. The oxygen meter shall continuously monitor oxygen levels and have an audible warning. If the oxygen content falls below 19% then all personnel must withdraw from the working area in the mine until the oxygen content increases to safe levels.
 - 3. Flame Safety Lamp. The flame safety lamp shall be lowered to the intended level of the bottom form from the surface. If the flame safety lamp is extinguished upon withdrawal then the mine may not be entered until the oxygen level increases. The flame safety lamp shall accompany the bottom form installer during the time in the mine. If the quality and/or intensity of the flame decreases, then the installer must withdraw from the working area until the oxygen content increases.
 - 4. Any remedy for increasing oxygen content of the working area and/or providing ventilation from the surface must be determined in consultation with the OWNER and the Certified Person.

3.02 HANDLING

- A. PUF shall be applied by workers wearing organic respirator masks and safety glasses or goggles. State or Federal regulations requiring additional equipment shall supersede these specifications.

3.03 TRANSPORT

- A. The CONTRACTOR shall follow all applicable State and local regulations for transport and use of PUF and chemicals required for cleanup. The CONTRACTOR shall also obtain any necessary permits for transportation. The CONTRACTOR shall be aware of agencies and jurisdictions requiring notification in the event of a component leak or spill. In the event of a leak or spill, the CONTRACTOR shall notify the appropriate parties.

PART 4 - EXECUTION

4.01 CLEARING DEBRIS

- A. Clear debris other than fixed, attached or permanent structures from the shaft before PUF is installed *as directed by the OWNER*. Historic structural features shall be preserved and maintained. Any historic debris removed shall be placed neatly to the side of the opening.

4.02 FORMWORK

- A. The formwork shall be installed below the surface of the shaft at the bottom of the foam depth level. The depth of foam required to plug a shaft shall be determined by the following formulas, where "*a*" is the smaller dimension of a rectangular shaft opening and "*b*" is the larger dimension, with both "*a*" and "*b*" measured in feet:
 - 1. for shafts where $a = b$, the depth of foam should be: $2a$.
 - 2. for shafts where $a < b < 3a$, the depth of foam should be: $2a + \frac{1}{2}(b-a)$
 - 3. for shafts where $b > 3a$, the depth of foam should be: $3a$.
- B. Cross-member supports may be placed at an angle not more than 20 degrees from horizontal as long as both ends are seated in the shaft. The bottom form shall be set over the cross-members.
- C. Bottom forms shall be completed prior to application of any polyurethane foam. The installed depth to bottom form shall be indicated on the as-built drawings for polyurethane foam closures. Any breach in the bottom form caused by vandals or rock fall shall be repaired prior to arrival of PUF applicators at that site. The CONTRACTOR is responsible for the integrity of the bottom form, and the loss of any polyurethane should it fail.

4.03 VENTILATION/DRAIN PIPE

- A. The ventilation/drain pipe shall be placed over a portion of the bottom form unobstructed by cross-members. The ventilation/drain pipe shall be open to the shaft after installation of the foam. The ventilation/drain pipe shall be supported by a tripod or other load-bearing device such that the load is not placed on the bottom form.
- B. The 2-inch PVC ventilation/drain pipe (SDR 35) shall be installed into the approximate center of the PUF installation and shall extend vertically to the lines and grades as shown on the Standard Drawings.
- C. The PVC ventilation/drain pipe shall extend up through the entire PUF and concrete plug

installation to provide ventilation and a water course through the entire structure. The 2-inch PVC shall be cut off level at the top of the concrete plug.

4.04 POLYURETHANE FOAM (PUF)

- A. PUF shall be applied in lifts with a maximum rise of 1.5 feet. Installed PUF lifts shall pass through the tack free stage before applying the next lift. At no time shall sprayed or poured PUF cut into rising foam. The PUF shall be applied in such a manner that the entire void is filled, and that shadow zones or voids are not created during PUF application, and does not raise the temperature to unsafe levels. At the discretion of the OWNER, thermocouples may be used to monitor exothermic generation. PUF application shall cease if heating or off-ratio foam is observed. The CONTRACTOR shall remedy off-ratio foam and demonstrate proper quality PUF to the OWNER before application resumes. See Part 5 below for characteristics of off-ratio foam.
- B. The surface of the void to be filled shall be as free as possible of grease and standing water. PUF shall not be applied to surfaces with running water. Remedial action for such situations shall be specified by the OWNER. Polyurethane foam shall not be applied directly to a debris plug, but must be applied to a bottom form of known physical and chemical properties. PUF shall not be applied during rain unless the foam is protected from interaction with water by a physical barrier.
- C. If off-ratio PUF is observed, the applicator must stop, correct the imbalance and continue application with the proper ratio PUF. Correction and determination of the foam ratio shall be done on a plastic sheet away from the work area. Any lift of off-ratio PUF comprising over two percent (2%) of the intended PUF column height shall be removed. An amount of off-ratio PUF less than two percent (2%) of the specified volume may remain if allowed to cool, and if the outer perimeter of off-ratio foam is removed.
- D. The CONTRACTOR shall be responsible for any lost or damaged equipment. In addition, damages or claims arising from PUF overspray shall be the responsibility of the CONTRACTOR. Under no circumstances shall foreign material be placed in the PUF unless specifically authorized by the OWNER. Non-PUF materials must be non-toxic, non-hazardous and not compromise the strength or water saturation characteristics of the PUF.
- E. Upon reaching the specified grade as shown on the Standard Drawings, the CONTRACTOR shall clean up PUF operations and wait a minimum of one hour before initiating construction of the concrete plug.

4.05 CONCRETE PLUG

- A. The concrete plug shall be placed directly on top of the polyurethane foam (PUF) as shown on the Standard Drawings and be one foot thick, covering the entire width of the opening. There shall be complete contact along the entire perimeter of the plug with the opening walls.
- B. The CONTRACTOR shall determine the means of concrete plug placement and submit it to the OWNER for approval prior to the start of construction.
- C. The top of the concrete plug shall be reasonably smooth and completed to provide drainage to the 2-inch PVC ventilation/drain pipe.

- D. Placement of backfill on top of the concrete plug will not be allowed until the structure has cured for a minimum of 24 hours.

4.06 FILTER CLOTH

- A. The geotextile filter cloth shall be placed in all required structures in a manner acceptable to the OWNER.
- B. Fabric shall be rejected, at the time of installation, if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation or storage. Fabric damaged before or during the installation shall be replaced at the CONTRACTOR's expense.
- C. The fabric shall be placed without stretching and shall lie smoothly in contact with the concrete plug surface. Each strip shall be continuous in width with no joints. The fabric shall be placed with overlapping seams perpendicular to the long axis of the opening. When end overlapping of strips is necessary, the joints shall be overlapped a minimum of two feet. End overlaps shall be made in the direction of the long axis of the opening. The work shall be scheduled so that not more than one day elapses between the placement of the fabric and the time it is covered with the specified material.
- D. The filter cloth shall be installed over the top of the concrete plug and 2-inch PVC ventilation/drain pipe so that free drainage is possible.

4.07 RANDOM FILL MATERIAL

- A. Random fill material shall consist of on-site, native materials as approved by the OWNER. Fill material shall be placed to the thickness shown on the Standard Drawings.
- B. Materials for random fill material shall be placed by methods to produce a uniform mass. The first two-foot lift shall be placed by hand or bucket to lower the velocity of impact against the concrete plug. The final surface of the backfilled opening shall be mounded a minimum of one foot above the original ground. Care should be taken not to plug the drain pipe with fill material.

4.08 SITE CLEAN-UP

- A. All construction generated trash and debris, such as scrap materials and spilled PUF or concrete, shall be cleaned up and removed. CONTRACTOR shall avoid spraying foam at undesignated targets. Improperly applied PUF and overspray shall be removed.

4.09 MODIFIED PUF CLOSURE (TYPE B— RECESSED SURFACED)

- A. The standard PUF closure design is modified for shafts designated as historically significant. For these openings, the random fill material shall be placed to within three feet of the adjacent ground surface as shown on Standard Drawing No. 5. The positions of the bottom form, PUF, and concrete are lowered accordingly. The intent of the recessed fill is to maintain the original appearance of the opening while still eliminating a serious fall hazard. Shafts designated as historically significant are listed in Appendices A and E.

PART 5 - FIELD QUALITY CONTROL

5.01 INSPECTIONS

- A. Periodic checks of the quality of PUF applied shall be made by the OWNER. The main check on quality will be visual. Acceptable PUF shall be tan-white to buff in color with no vesicles and a smooth to coarse orange peel surface. Any one of the following conditions shall cause PUF application to cease, and efforts to correct the off-ratio condition begin.

CONDITION	POSSIBLE CAUSE
Dark PUF Color Smooth and Glassy Friable or Brittle PUF Improper Density	Excess A Component
Light in Color to White Bad Cell Structure Mottled Appearance Blowholes or Pinholes	Excess B Component
Slow rise Poor Cell Structure Frequent Equipment Clogging Slow Curing Bad Physical Properties	Bad Material

- B. At any time during PUF application, the OWNER may call for a density test. The applicator shall fill a container provided by the OWNER for this purpose, and the sample will be tested for density. The density of the sample shall be within eight percent (8%) of the nominal 2 pounds per cubic foot density, with a minimum installed density of 1.85 pounds per cubic foot. Density tests indicating PUF installed is not within the minimum specified shall cause corrective action resulting in PUF within the acceptable nominal range, less deviation due to barometric pressure changes from STP (Standard Temperature and Pressure).
- C. Density tests of PUF shall be conducted at no cost to the OWNER. At the discretion of the OWNER, density tests showing PUF in the acceptable range may be taken in the center of the cavity to which PUF is being applied. A sampling box constructed of sheet aluminum and lined with polyethylene may be lowered into the cavity to take a representative sample of PUF just above the level of installed polyurethane.

MEASUREMENT AND PAYMENT

6.01 SPECIAL CONSIDERATIONS

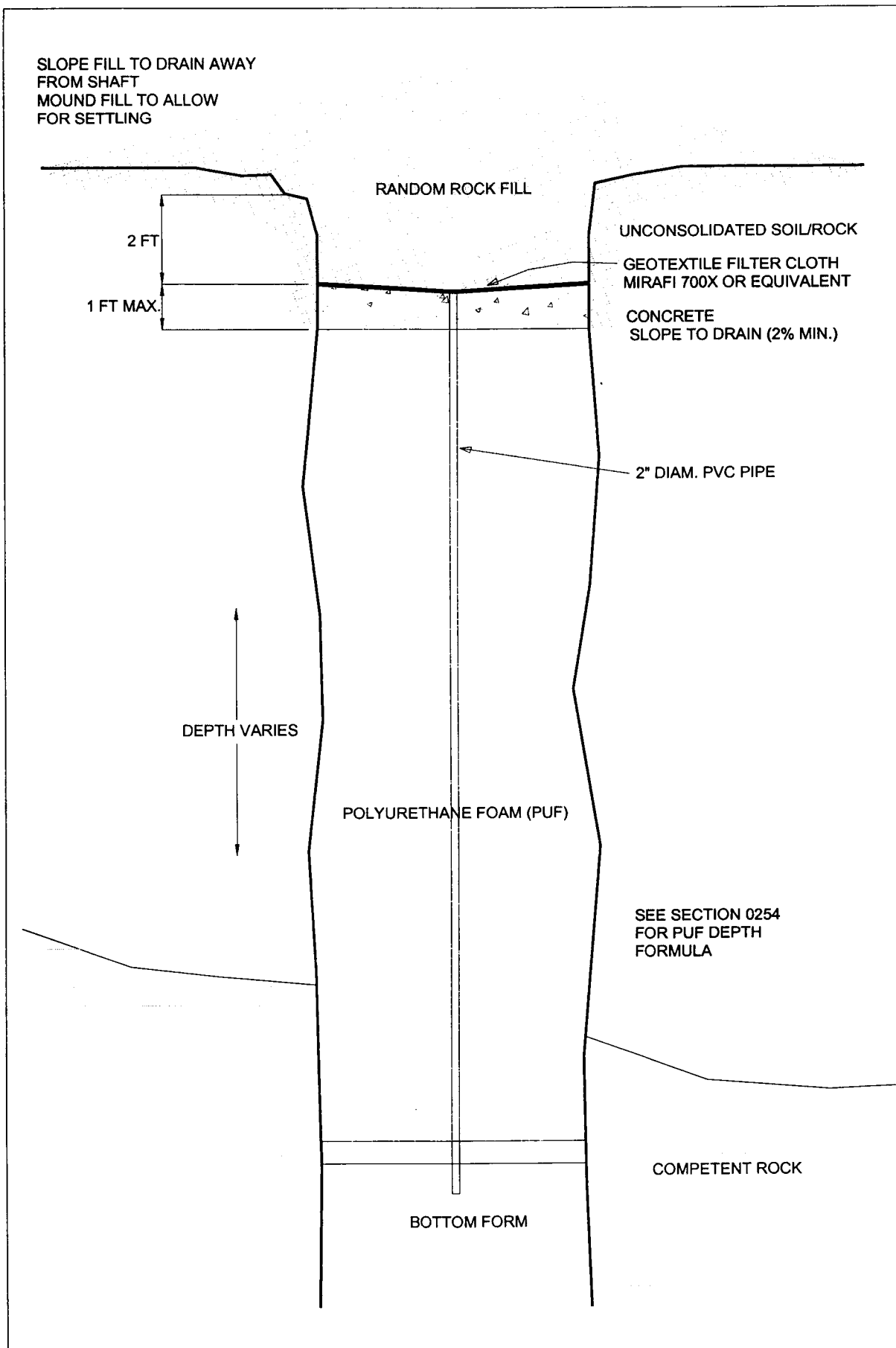
The CONTRACTOR's attention is specifically directed to the following.

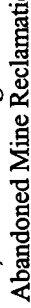
- A. The final quantities for the major categorizations of materials may vary from the quantities shown on the site specific summary sheets in Appendix B. The quantities estimated are based on information gathered and interpreted from surface investigations.
- B. The boundaries of classified materials, along with the volumes are estimates and intended to serve as a guide in outlining the scope of work and evaluating the bids.

6.02 QUANTITY MEASUREMENTS

- A. Polyurethane foam closures will be paid for at the contract Bid Price per each closure completed. Payment at the Bid Price shall be full compensation for furnishing, placing all materials, including all labor, equipment, tool, and incidentals necessary to complete closure installation in accordance with the Standard Drawings and Specifications.
- B. Installation of PUF, fabrication of the concrete plug, placement of filter cloth and ventilation/drain pipes, backfill, revegetation, and cleanup will not be measured for direct payment but will be considered subsidiary to PUF closures.
- C. No payment shall be made for off-ratio PUF.

END OF SECTION 0254



<div><div>UTAH NATURAL RESOURCES Oil, Gas & Mining Abandoned Mine Reclamation Program</div></div>	TEMPLE MOUNTAIN PROJECT AMR/015/914		POLYURETHANE FOAM (PUF) SHAFT CLOSURE
	Scale: as noted	Design: LAA Drafting: JCR	
	Refer to Spec Section 0254		Sheet E14 of E14